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Sample Vials and Accessories

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Waters Autosampler Vials



Waters is a leading manufacturer of analytical instrumentation and consumable products. We understand the importance of autosampler vials for the performance of analytical instrumentation. There are many factors to consider in selecting the proper vial:

- Needle design
- Optic and robotic specifications
- Autosampler tray design
- Volatility
- Chemical compatibility
- Sample volume
- Cleanliness

At Waters, we take all of these factors into consideration in the design, manufacture and delivery of our vials and accessories. Unlike our competition, who offer Type I, 33-expansion glass in North America and Type I, 51-expansion glass in Europe or Japan, Waters single source manufacturing produces Type I, 33-expansion glass, the lowest free ion glass available, for worldwide distribution.

Waters Certified Vials Product Lines

Waters offers two lines of certified vials. Both lines are certified as being within dimensional tolerances and are tested for chemical cleanliness by instrumentation methods.

Waters LCGC Certified Vials

The LCGC Certified Vials are tested by HPLC using UV detection. The HPLC test was developed to look for trace levels of chemicals used in the manufacturing and packaging process. These chemicals include; lubricants, surfactants, antistatic and antioxidants from packaging. The tests are run on each batch of vials, after they have been packaged for several days, to ensure cleanliness. An additional headspace GC Test is done to look for proper curing of the silicone septa.

Waters LCMS Certified Vials

LCMS certified vials are tested using MS detection. In this test, we took an unbiased approach and look for any ionized masses regardless of the source. The test is run in scan mode with specifications set on total ion count and presence of clusters in the high mass range.

Choosing the Right Vial and Septum for Your Application

There are three decisions you need to make when choosing the correct vial for your application: the septum, the closure and the vial itself. Read through the selection options below to determine the proper combination for your application. For your convenience, Waters offers many of these choices as combination packs. The vial, cap, and septum come pre-packaged as packs of 100 for ease and convenience in ordering.

Septa Selection Guide

PTFE

- Recommended for single injection applications
- Ideal for use in MS applications
- Excellent solvent resistance and chemical compatibility
- Does not reseal upon puncturing
- Not recommended for long-term sample storage

PTFE/Silicone

- Recommended for multiple injections and sample storage
- Demonstrates excellent resealing characteristics
- PTFE chemical resistance until punctured, then the septum will have the chemical compatibility of silicone
- Working temperature range from -40 °C to 200 °C

Pre-slit PTFE/Silicone

- Provides adequate venting to prevent vacuum formation in sample vial, delivering excellent sample-draw reproducibility
- Eliminates coring from bottom draw-port needles
- Good resealing capabilities
- Recommended for multiple injections
- Working temperature range from -40 °C to 200 °C

PE Septumless

- Same advantages as PTFE



Literature References

Sample Vials & Accessories Brochure,
Literature Reference 720001818EN

Waters LC/MS Certified
Sample Vials Whitepaper,
Literature Reference 720001517EN

Determination of the Level of Ion
Suppression from LC/MS Vials,
Literature Reference WA60004

Waters Certified Sample Vials
Technical Whitepaper,
Literature Reference 720001303EN

Vial Closures Guide

Vials are available in three closure types: crimp, snap, and screw cap. Each closure has its advantages and disadvantages.

Crimp caps squeeze the septum between the rim of the glass vial and the crimped aluminum cap. This forms an excellent seal preventing evaporation. The septum stays seated during piercing by the autosampler needle. The crimp cap vial requires crimping tools to carry out the sealing process. For few samples, manual crimper tools are the best choice. For large numbers of sample, automated crimpers are available.

Snap caps are an extension of the crimp cap system of sealing. A plastic cap is stretched over the rim of the vial to form a seal by squeezing the septum between the glass and the stretched plastic cap. The plastic cap creates tension when trying to return to its original size. This tension forms the seal between glass, cap and septum. Plastic snap caps do not require any tools to assemble.

Snap caps are not as effective a seal as other closures.

- If the fit of the cap is very tight, the cap is hard to apply and may be subject to crack.
- If the fit is too loose, the seal is poor and the septum may dislodge.

Screw caps are universal. Screwing the cap applies a mechanical force that squeezes the septum between the glass rim and the cap. Screw caps form an excellent seal and mechanically hold the septum in place during piercing. No tools are required for assembly.

LectraBond™ screw caps are available through Waters. This screw cap has a PTFE/silicone septum bonded to the polypropylene cap, using a non-solvent bonding process. This bonding technology is designed to keep the septum/cap together during shipment and assembly onto vials. The bond will aid in preventing dislodging of the septum during use, but the primary sealing mechanism is the mechanical force applied by tightening the cap to the vial.

Cap tightening is the mechanism that forms the seal and holds the septum in place during needle insertion. There is no need to over-tighten the cap, as it can compromise the seal and lead to dislodging. The septum starts to cup or indent when you begin to over-tighten.

Cap Design	Strength Design	Comment
Crimp	Excellent seal	Requires tools
Snap	Moderate seal	Fast, no tools, some cap cracking
Screw	Excellent seal	Universal

Vial Selection Guide

Type 1, 33-Expansion Borosilicate Glass

The most chemically-inert glass available, generally used in high precision laboratories to prevent alteration of test results. It has an expansion coefficient of approximately $33 \times 10^{-7} \text{ }^{\circ}\text{C}$ and is composed primarily of silicon and oxygen, with trace amounts of boron and sodium.

Type 1, 51-Expansion Glass

More alkaline than 33-expansion glass and is adequate for many laboratory uses. It has an expansion coefficient of $51 \times 10^{-7} \text{ }^{\circ}\text{C}$ and is composed primarily of silicon and oxygen, with trace amounts of boron. All amber glassware is 51-expansion glass.

Deactivated Glass (DV)

For glass-sensitive compounds, glass vials are treated with gas phase reactive organosilane to produce a hydrophobic glass surface. Vials treated by this procedure can be stored indefinitely.

Polypropylene Plastic

Polypropylene is a non-reactive plastic and can be used where glass is not an appropriate option. Polypropylene vials can be incinerated while still sealed, minimizing exposure to potentially hazardous substances. The maximum temperature use is: $135 \text{ }^{\circ}\text{C}$.

Deactivated Glass Vials (DV) and Inserts



Eliminates adsorption of compounds onto the glass surface when working with biological or pharmaceutical compounds, natural products, pesticides and herbicides. The surface modification is permanent, resulting in an indefinite shelf life.

Waters Alliance Total Recovery Vial



Specifically designed for the side draw-port needle and the factory needle draw depth settings of the Waters Alliance 2690/2695 HPLC. This vial delivers maximum sample capacity ($\sim 1 \text{ mL}$) with minimum residual volume ($\sim 9 \text{ } \mu\text{L}$).

Waters Maximum Recovery Vial

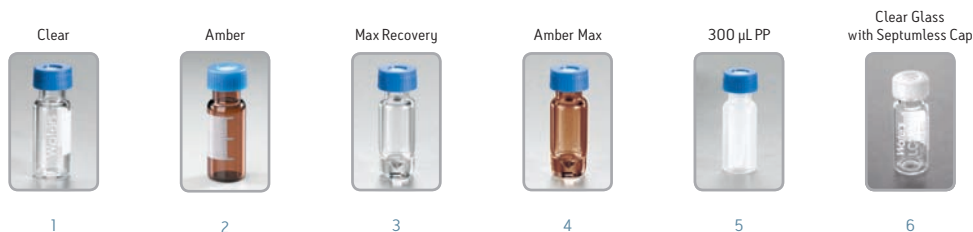


Specifically designed for the bottom draw-port needle of the Waters ACQUITY UPLC and Alliance HT HPLC Systems. This vial delivers maximum sample capacity ($\sim 1.5 \text{ mL}$) with minimum residual volume. The 9 mm cap makes it ideal for use with Agilent HPLC and GC Systems.

Screw Cap 12 x 32 mm Vials for ACQUITY UPLC Systems

This selection of 12 x 32 mm vials are the most commonly ordered vials by customers using Waters ACQUITY UPLC Systems.

**For PEEK and
Metal-Tipped Needles**



LCMS Certified Combination Packs						
Vial, Cap and Pre-slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV	600000755CV		
LCGC Certified Combination Packs						
Bonded Pre-slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186003886C		
Bonded Pre-slit Silicone/PTFE Septum Deactivated	186000307DV	186000847DV	186000327DV			
Combination with PE Septumless Cap	186004132C	186004133C	186004168C			186004132C
Combination Packs						
Bonded Pre-slit Silicone/PTFE Septum					186002639	
Combination with PE Septumless Cap					186004112	
Injectable Volumes ACQUITY UPLC						
Max	1600 µL	1600 µL	1100 µL	1100 µL	210 µL	1600 µL
Residual*	165 µL	165 µL	22 µL	22 µL	20 µL	165 µL

All items come in quantities of 100 unless otherwise noted. * If you need to access more sample, go to the advanced setting screen in the Sample Manager Instrument Method Editor to change the needle placement.

For the Amino Acid ACQUITY UPLC System and the MassTrack™ Amino Acid Analysis Solution System, use of Waters Total Recovery Vials are recommended, Part Number 186004631.

ACQUITY UPLC Vial Holder

Description	Part No.
48-Well Vial Holder	405003743



ACQUITY UPLC Vial Descriptions

Screw Cap 12 x 32 mm Vials for ACQUITY UPLC Systems	
1	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Cap).
2	Amber 12 x 32, Type 1, 51-Expansion Glass Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Cap).
3	Waters Maximum Recovery Vial, 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
4	Waters Amber Maximum Recovery Vial, 12 x 32, Type 1, 51-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
5	Polypropylene 12 x 32, 300 µL Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
6	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Septumless Cap).

Waters Vials Selector

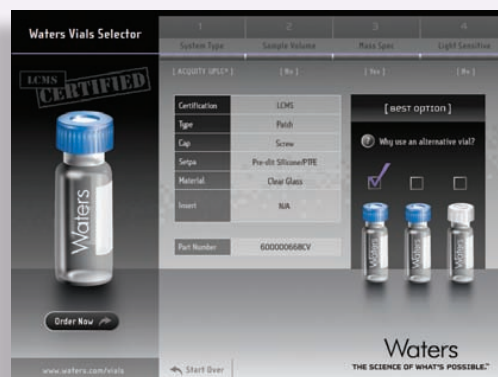
The Waters Vials Selector is designed to simplify the process of selecting the best vial solutions for your system and application requirements.

The selector offers vial options matching the criteria entered, such as the system you are using, sample volume, detection method and light sensitivity of analytes. As a registered user, you will be notified of all future updates.

For more information about Waters Certified Vials please visit

www.waters.com/vialsselector

This interactive tool requires that the user has Adobe Flash Player 8.



Settings for ACQUITY UPLC Vials

Vial Column Number*	Description	Total Height (mm)	Vial Depth (mm)	Residual Volume	Needle Placement	Comments
1,2,6	Screw Cap Vial	38.3	32.0	165 µL	2 mm	Preset
1,2,6	150 µL or 300 µL Insert Inside Vial 1 or 2	38.3	31.0	4 µL	3 mm	Advanced Settings
3,4	Max Recovery Vial	38.3	32.0	22 µL	2 mm	Preset
5	300 PP Vial	38.3	31.0	20 µL	3 mm	Advanced Settings

*Please reference the listing of Vials Descriptions on page 58 for more details.

The table above shows vial depths, residual volumes and needle placements for several products. In the ACQUITY UPLC® system, the default needle placement for 48-well vial holders with a 2 mL vial (ANSI 48 vial 2 mL holder) is automatically preset and brings the needle down to a depth which is 2 mm from the bottom of the vial. The residual sample volume remaining in the vial for a 2 mm offset is recorded in the table above.

For situations where you need to access more of the sample, or if you need to keep the needle further from the bottom of the vial, go to the advanced setting screen in the Sample Manager Instrument Method Editor to change the needle placement.

Please note that you must go to the advanced settings and change the needle placement to 3 mm for vial number 5 in the table above. You will also have to review needle settings when using glass inserts.

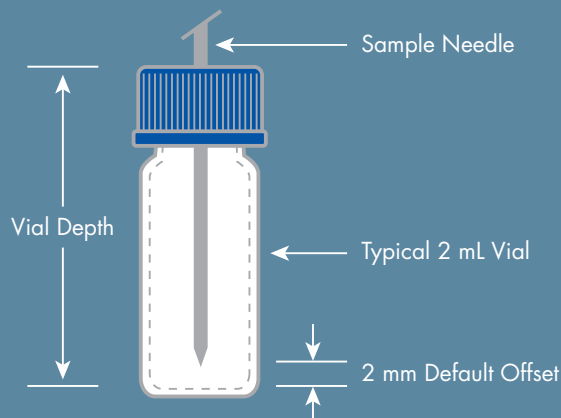
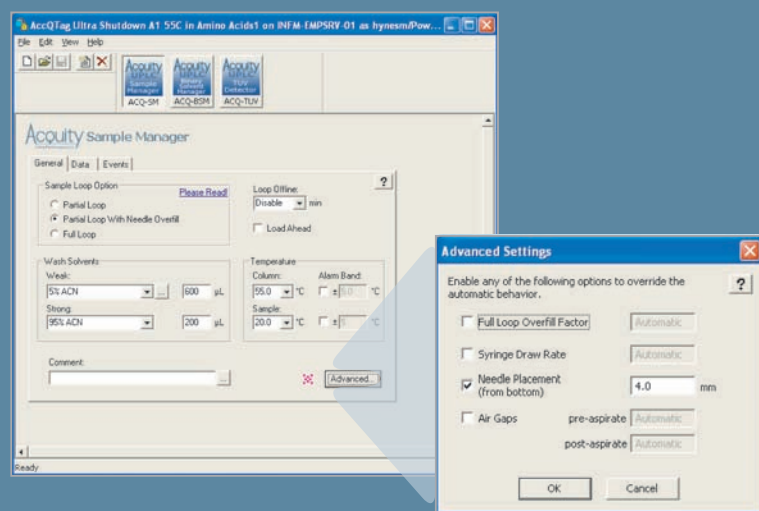
Waters ACQUITY UPLC System Sample Manager

The Waters ACQUITY UPLC System Sample Manager incorporates several technology advancements. The Sample Manager loop design and injection modes maintains low dispersion and facilitates fast cycle times. The system performance is monitored and diagnosed through the console software. It uses needle-in-needle sampling for improved ruggedness and a needle calibration sensor for increased accuracy. A variety of sample holder formats (vials or tubes) and microtiter plate formats (deep well, mid height) can also be accommodated in a thermostatically-controlled environment. Within the ACQUITY UPLC

Sample Manager Instrument Method Editor, a number of parameters can be customized for your specific task, including depth, as shown here, to confer maximum sample format flexibility.

For further information on setting vial depth offsets, see the ACQUITY UPLC Operator's Guide (information documentation set for ACQUITY UPLC– Part Number 716001664) or visit the ACQUITY UPLC Sample Manager Instrument Method Editor On-Line Help.

Waters ACQUITY UPLC System Sample Manager Version 1.30 and later



Plates for ACQUITY UPLC Systems

	96-Well Plates			384-Well Plates	
Plate	186002643	186002481	186002482	186002632	186002631
Pack Size	100	50	50	50	50
Well Volume	350 µL	800 µL	2 mL	250 µL	100 µL
Sealing Options					
Polypropylene Cap Mat 50/pk	186002483	186002483	186002484		
Clear Polyester Heat Seal 100/pk	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal 100/pk	186002789	186002789	186002789	186002789	186002789
Residual Volume in ACQUITY at default needle placement of 2 mm*	35 µL	15 µL	20 µL	15 µL	15 µL

Note: (DV) after the number means a deactivated version of the product is available by adding a DV to the right of the part number when ordering.

* If you need to access more sample, go to the advanced setting screen in the Sample Manager Instrument Method Editor to change the needle placement.

Glass Inserts for 96-Well Plates

Description	Part No.	Max Volume	Residual Volume
Plates for Quick-Load Glass – Widest Opening for Inserts, 20/pk	186001438 ¹		
• 700 µL Glass – Quick-Load, 1/pk	186001437 (DV) ²	650 µL	15 µL
• 1 mL Glass – Quick-Load, 1/pk	186001436 (DV) ²	850 µL	15 µL
96-Well Plate with 700 µL Glass Insert, 1/pk	186000349 (DV) ²	650 µL	15 µL
96-Well Plate with 1 mL Glass Insert, 18/pk	186000855 (DV) ²	850 µL	15 µL
Sealing Cap for 700 µL Glass Insert – Square Well Seals Against the Well Wall PTFE/Silicone, 5/pk	186000857		
Sealing Cap for 1 mL Glass Inserts – Seals in the Glass PTFE/Silicone, 10/pk	186000856		

¹ Plate 186001438 must be used with the quick load units.

² When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

Quick-Load Inserts for 96-Well Plates



Quick-load packs are the easy and fast way to load your plate with glass inserts



Heat Seal for ACQUITY UPLC Systems

Heat Sealer	Part No.
115 Volt	186002786
240 Volt	186002787

Heat Sealer Operating Guidelines

For more information regarding heat sealers, download the data sheet number 720001330EN at <http://www.waters.com/library>

Heat Seal	Temperature Range	Solvent Range	Recommendation
Clear Polyester	From -80 °C to 80 °C	Good for Most Lab Solvents	
Aluminum Foil Laminate	From -200 °C to 90 °C	Good for Most Lab Solvents	Best for Long Term Storage

The aluminum foil laminate heat seal is good for most solvents used in laboratories. For applications requiring DMSO, the plates should be stored at 4 °C.

Position the seal with the white side facing up. Apply heat using the Waters Heat Sealer for 2 to 3 seconds in both directions following the instructions found on page 9 in the heater manual, part number: 720001330EN.

The clear polyester heat seal is a non-conductive seal. For applications requiring DMSO, the plates should be stored at 4 °C.

Position the seal with the shiny side facing up. Apply heat using the Waters heat sealer for 2 to 3 seconds in both directions following the instructions found on page 9 in the heater manual, part number: 720001330EN.

Both of these seals can be peeled off by hand. For plate storage, apply a new unpierced seal or polypropylene cap mat.



Heat sealer dimensions: 5.75 x 13 x 6"
(140 x 330 x 150 mm)



Literature References

Sample Vials and Accessories Brochure,
Literature Reference 720001818EN

Waters Heat Sealer User Manual,
Literature Reference 720001330EN

96-well Collection Plate Options for the
Waters Extraction Plate Manifold,
Literature Reference 720001263EN

Waters 96 and 384-Well
Collection Plate Specifications,
Literature Reference WA41941

Waters LC/MS Certified
Sample Vials Whitepaper,
Literature Reference 720001517EN

Determination of the Level of Ion
Suppression from LC/MS Vials,
Literature Reference WA60004

Waters Certified Sample Vials
Technical Whitepaper,
Literature Reference 720001303EN



ACQUITY® TQD System featuring the TQ detector and sample organizer

Most Commonly Used Vials for Alliance Systems

This selection of 12 x 32 mm vials are the most commonly ordered vials by customers using Waters Alliance Separations Modules. This page is intended to be a quick selection guide. For the complete selection of vials and accessories for Alliance, turn to pages 64-65.



LCMS Certified Combination Packs								
Vial, Cap and Pre-slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV			600000671CV	600000755CV	
LCGC Certified Combination Packs								
Bonded Silicone/PTFE Septum					WAT270946C			
Combination with PE Septumless Cap								186004132C
Combination Packs								
Bonded Pre-slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186002639		186000385C	186003886C	
Combination Deactivated	186000307DV	186000847DV	186000327DV			186000385DV		
Injectable Volumes Alliance 2690/2695								
Max	1100 µL	1100 µL		280 µL	1100 µL	950 µL		1100 µL
Residual	750 µL	750 µL		20 µL	750 µL	9 µL		750 µL
Injectable Volumes Alliance 2790/2795								
Max	1700 µL	1700 µL	1500 µL	290 µL	1700 µL		1500 µL	1700 µL
Residual	170 µL	170 µL	22 µL	10 µL	170 µL		22 µL	170 µL
Insert								
150 µL with Poly Spring	WAT094171 (DV) ¹	WAT094171 (DV) ¹			WAT094171 (DV) ¹			
Max Volume Injection/Max Residual Volume	144 µL/6 µL	144 µL/6 µL			144 µL/6 µL			144 µL/6 µL
Compatible Systems								
Alliance 2690/2695	•	•		•	•	•		•
Alliance 2790/2795	•	•	•	•	•		•	•

¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

For more details, see vials descriptions on pages 72 and 73.



Plates for Alliance HT Systems

	96-Well Plates			384-Well Plates	
Plate	186002643	186002481	186002482	186002632	186002631
Pack Size	100	50	50	50	50
Well Volume	350 µL	800 µL	2 mL	250 µL	100 µL
Sealing Options					
Polypropylene Cap Mat 50/pk	186002483	186002483	186002484		
Clear Polyester Heat Seal 100/pk	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal 100/pk	186002789	186002789	186002789	186002789	186002789
Alliance 2795 Residual Volume	35 µL	15 µL	20 µL		

For more details, see vials descriptions on pages 72 and 73.

Heat Sealer

Description	Part No.
115 Volt	186002786
240 Volt	186002787

Roller for Cap Mats

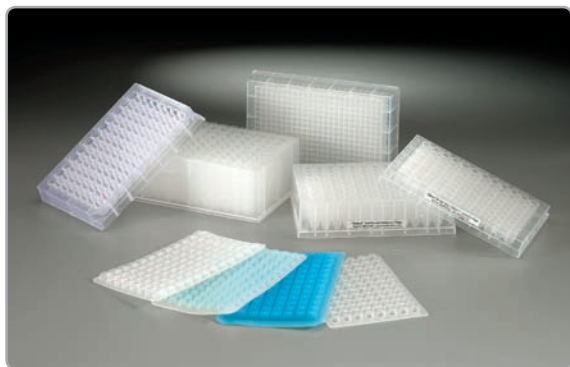
Description	Part No.
Roller for Mats	186002633

Glass Inserts for 96-Well Plates

Description	Part No.
Plates for Quick-Load Glass – Widest Opening for Inserts, 20/pk	186001438 ¹
• 700 µL Glass – Quick-Load, 1/pk	186001437(DV) ²
• 1 mL Glass – Quick-Load, 1/pk	186001436(DV) ²
96-Well Plate with 700 µL Glass Insert, 1/pk	186000349(DV) ²
96-Well Plate with 1 mL Glass Insert, 18/pk	186000855(DV) ²
Sealing Cap for 700 µL Glass Square Well PTFE/Silicone, 5/pk	186000857
Sealing Cap for 1 mL Round Well – Seals in the Glass PTFE/Silicone, 10/pk	186000856

¹ Plate 186001438 must be used with the quick load units.

² When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.



Selection of plates and cap mats



Roller for cap mats



Heat sealer

Screw Cap 12 x 32 mm Vials for Alliance Systems



LCMS Certified Combination Packs							
Vial, Cap and Silicone/PTFE Septum	600000751CV	600000752CV	600000749CV			600000750CV	600000754CV
Vial, Cap and Pre-slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV			600000671CV	600000755CV
LCGC Certified Combination Packs							
Bonded Silicone/PTFE Septum	186000272C	186000846C	186000326C	186002640 ³	WAT270946C ²	186000384C	186003885C
Combination Deactivated	186000272DV	186000846DV	186000326DV		WAT270946DV ²	186000384DV	
Bonded Pre-slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186002639 ³		186000385C	186003886C
Combination Deactivated	186000307DV	186000847DV	186000327DV			186000385DV	
Combination with PE Septum-less Cap	186004132C	186004133C	186004168C	186004112 ³		186004167C	
Vials Only							
Vials Only	186000273	186000848	186002802	186002626	WAT063300	186002805	
Deactivated Vials Only	186000273DV	186000848DV			WAT063300DV		
Injectable Volumes Alliance 2690/2695							
Max	1100 µL	1100 µL		280 µL	1100 µL	950 µL	
Residual	750 µL	750 µL		20 µL	750 µL	9 µL	
Injectable Volumes Alliance 2790/2795							
Max	1700 µL	1700 µL	1500 µL	290 µL	1700 µL		1500 µL
Residual	170 µL	170 µL	22 µL	10 µL	170 µL		22 µL
Inserts							
300 µL with Poly Spring	WAT094170(DV) ¹	WAT094170 (DV) ¹			WAT094170 (DV) ¹		
Max Volume Injection/Max Residual Volume	230 µL/20 µL	230 µL/20 µL			230 µL/20 µL		
150 µL with Poly Spring	WAT094171 (DV) ¹	WAT094171 (DV) ¹			WAT094171 (DV) ¹		
Max Volume Injection/Max Residual Volume	144 µL/6 µL	144 µL/6 µL			144 µL/6 µL		
Cap and Septum							
PE Septumless Caps	186004169	186004169	186004169	186004169		186004169	186004169
Cap Black					WAT058875		
Septa Silicone/PTFE					WAT058874		
Screw Cap and Septum – Silicone/PTFE							
PE Septum-less Cap	186004169	186004169	186004169	186004169		186004169	
Blue LectraBond	186000274	186000274	186000274	186000274		186000274	
Red LectraBond	186002129	186002129	186002129	186002129		186002129	
Green LectraBond	186002130	186002130	186002130	186002130		186002130	
White LectraBond	186002456	186002456	186002456	186002456		186002456	
Screw Cap and Pre-slit Septum – Silicone/PTFE							
Blue LectraBond	186000305	186000305	186000305	186000305		186000305	
Red LectraBond	186002128	186002128	186002128	186002128		186002128	
Green LectraBond	186002127	186002127	186002127	186002127		186002127	
White LectraBond	186002457	186002457	186002457	186002457		186002457	
For Dissolution System							
Pre-assembled Vial, Cap and Pre-slit Septum	186000989(DV) ¹	186003455					
Compatible Systems							
Alliance 2690/2695	.	.		.	.	.
Alliance 2790/2795	.	.	.	.	.		.

All items come in quantities of 100 unless otherwise noted. ¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number. ² Septum not bonded. ³ Vials not certified.



Snap Cap 12 x 32 mm Vials for Alliance Systems



Combination Packs							
Vial, Cap and Silicone/PTFE Septum				186002642			186000234(DV) ¹
Vial, Cap and Pre-slit Silicone/PTFE Septum				186002641			
Vials							
Vials Only	WAT094219	WAT094220	186000984	186002628	WAT094222	WAT094223	186000302
Deactivated Vials Only	WAT094219DV	WAT094220DV	186000984DV		WAT094222DV	WAT094223DV	186000302DV
Injectable Volumes Alliance 2690/2695							
Max	1100 µL	1100 µL		280 µL	1100 µL	1100 µL	950 µL
Residual	750 µL	750 µL		20 µL	750 µL	750 µL	9 µL
Injectable Volumes Alliance 2790/2795							
Max	1700 µL	1700 µL	1500 µL	290 µL	1700 µL	1700 µL	
Residual	170 µL	170 µL	22 µL	10 µL	170 µL	170 µL	
Inserts							
300 µL with Poly Spring	WAT094170(DV) ¹	WAT094170 (DV) ¹			WAT094170 (DV) ¹	WAT094170 (DV) ¹	
Max Volume Injection/Max Residual Volume	230 µL/20 µL	230 µL/20 µL			230 µL/20 µL	230 µL/20 µL	
150 µL with Poly Spring	WAT094171 (DV) ¹	WAT094171 (DV) ¹			WAT094171 (DV) ¹	WAT094171 (DV) ¹	
Max Volume Injection/Max Residual Volume	144 µL/6 µL	144 µL/6 µL			144 µL/6 µL	144 µL/6 µL	
Snap Cap and Septum – Silicone/PTFE							
Blue	186000303	186000303	186000303	186000303			186000303
Black	186002649	186002649	186002649	186002649			186002649
Red	186002650	186002650	186002650	186002650			186002650
Snap Cap and Pre-slit Septum – Silicone/PTFE							
Blue	186000304	186000304	186000304	186000304			186000304
Black	186002648	186002648	186002648	186002648			186002648
Red	186002647	186002647	186002647	186002647			186002647
Snap Cap and PTFE Septum							
Blue	186000328	186000328	186000328	186000328			186000328
Black	186002645	186002645	186002645	186002645			186002645
Red	186002646	186002646	186002646	186002646			186002646
Crimp Cap							
Crimp Cap Silicone/PTFE Septum					PSL404219	PSL404219	
Crimp Cap PTFE/Silicone/PTFE Septum					PSL404231	PSL404231	
Compatible Systems							
Alliance 2690/2695	•	•		•	•	•	•
Alliance 2790/2795	•	•	•	•	•	•	

All items come in quantities of 100 unless otherwise noted.

¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

For more details, see vials descriptions on pages 72 and 73.

Holder for 12 x 32 mm Vials



Description	Part No.
Holder for 12 x 32 mm Vials (5/pk)	186004487

(Vials not included)

Vials for Waters 717 Autosampler

15 x 45 mm Vials



48 Position Carousel

Combination Packs							
Vial, Cap and LectraBond PTFE/Silicone Septum	186000838C	186001133C	186002629C				
Combination Deactivated	186000838DV	186001133DV					
Vial, Cap and LectraBond Pre-slit PTFE/Silicone Septum	186000839C	186001134C	186002630C				
Combination Deactivated	186000839DV	186001134DV					
Vial and PE Snap Cap					186004031	WAT025051	WAT025050
Components							
Vials Only	186000840(DV) ¹	186001135(DV) ¹	186002520	186000999 ²			
Max Volume Injection/Max Residual Volume	2400 µL/1600 µL	2400 µL/1600 µL	3000 µL/40 µL	2000 µL/1000 µL	2950 µL/50 µL	2400 µL/1600 µL	2400 µL/1600 µL
Cap LectraBond PTFE/Silicone 100/pk	186000841	186000841	186000841	186000841			
Screw Cap with Bonded PTFE/Silicone Septum 1000/pk	186000965	186000965	186000965	186000965			
Cap LectraBond Pre-slit PTFE/Silicone 100/pk	186000842	186000842	186000842	186000842			
Black Phenol Cap 144/pk	WAT072711	WAT072711	WAT072711	WAT072711			
PTFE Septum 1440/pk	WAT073005	WAT073005	WAT073005	WAT073005			
PTFE Septum 144/pk	WAT072714	WAT072714	WAT072714	WAT072714			
Self Sealing Septum 144/pk	WAT022861	WAT022861	WAT022861	WAT022861			
250 µL Glass Insert ³	WAT072704(DV) ¹	WAT072704(DV) ¹		WAT072704			
Max Volume Injection/Max Residual Volume	244 µL/6 µL	244 µL/6 µL					
250 µL Glass Insert 144/pk ³	WAT015199(DV) ¹	WAT015199(DV) ¹					
Max Volume Injection/Max Residual Volume	230 µL/20 µL	230 µL/20 µL					
250 µL Plastic Conical Insert (PMP) 144/pk ³	WAT072030	WAT072030					
Max Volume Injection/Max Residual Volume	230 µL/20 µL	230 µL/20 µL					
Springs for LVI 100/pk	WAT072708	WAT072708					
250 µL PP Insert 1000/pk ³	186001729	186001729					

¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

² Item contains 1,000 vials

³ Inserts requires springs (Part No. WAT072708)

For more details, see vials descriptions on pages 72 and 73.

8 x 40 mm Vials



96 Position Carousel

Vials for 96 Position Carousel				
Shell Vial and Snap Cap	WAT025054C	WAT025053C	186000837C	WAT022476 ²
Shell Vial and Snap Cap Deactivated	WAT025054DV	WAT025053DV	186000837DV	
Pack Size	250	250	100	100
Max Volume Injection/Max Residual Volume	600 µL/400 µL	600 µL/400 µL	700 µL/6 µL	650 µL/50 µL
150 µL Glass Insert	WAT072294(DV) ¹	WAT072294(DV) ¹		
Spring for LVI	WAT072289	WAT072289		
Max Volume Injection/Max Residual Volume	144 µL/6 µL	144 µL/6 µL		
PE Snap Cap 1000/pk	WAT078515	WAT078515	WAT078515	WAT078515
200 µL PE Grad Insert with Poly Spring 1000/pk	186001728	186001728		
1 mL Shell Vial Assembled for Dissolution System, 500/pk	WAT022479			

For more details, see vials descriptions on pages 72 and 73.

All items come in quantities of 100 unless otherwise noted.

¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

² Vials not certified.

Vials for Waters 2707 Autosampler



LCMS Certified Combination Packs					
Vial, Cap and Pre-slit Silicone/PTFE Septum	600000668CV	600000669CV	600000670CV	600000755CV	
LCGC Certified Combination Packs					
Bonded Pre-slit Silicone/PTFE Septum	186000307C	186000847C	186000327C	186003886C	
Bonded Pre-slit Silicone/PTFE Septum Deactivated	186000307DV	186000847DV	186000327DV		
Bonded Silicone/PTFE Septum	186000272C	186000846C	186000326C	186003885C	
Combination Packs					
Bonded Pre-slit Silicone/PTFE Septum					186002639
Bonded Silicone/PTFE Septum					186002640
Injectable Volumes ACQUITY UPLC					
Max	1600 µL	1600 µL	1100 µL	1100 µL	240 µL
Residual	150 µL	150 µL	10 µL	10 µL	10 µL
Components					
150 µL with Poly Spring	WAT094171	WAT094171			
Max Volume Injection/Max Residual Volume	144 µL/6 µL	144 µL/6 µL			

All items come in quantities of 100 unless otherwise noted. For more details, see vials descriptions on pages 72 and 73.

Plates for Waters 2707 Autosampler

	96-Well Plates			384-Well Plates	
Plate	186002643	186002481	186002482	186002632	186002631
Pack Size	100	50	50	50	50
Well Volume	350 µL	800 µL	2 mL	250 µL	100 µL
Sealing Options					
Polypropylene Cap Mat 50/pk	186002483	186002483	186002484		
Clear Polyester Heat Seal 100/pk	186002788	186002788	186002788	186002788	186002788
Aluminum Foil Laminate Heat Seal 100/pk	186002789	186002789	186002789	186002789	186002789
2707 Residual Volume	125 µL	40 µL	60 µL	40 µL	40 µL

Glass Inserts for 96-Well Plates

Description (For Metal-Tipped Needles ONLY)	Part No.	Max Volume	Residual Volume
Plates for Quick-Load Glass – Widest Opening for Inserts, 20/pk	186001438 ¹		
• 700 µL Glass – Quick-Load, 1/pk	186001437 (DV) ²	650 µL	15 µL
• 1 mL Glass – Quick-Load, 1/pk	186001436 (DV) ²	850 µL	15 µL
96-Well Plate with 700 µL Glass Insert, 1/pk	186000349 (DV) ²	650 µL	15 µL
96-Well Plate with 1 mL Glass Insert, 18/pk	186000855 (DV) ²	850 µL	15 µL
Sealing Cap for 700 µL Glass Insert – Square Well Seals Against the Well Wall PTFE/Silicone, 5/pk	186000857		
Sealing Cap for 1 mL Glass Inserts – Seals in the Glass PTFE/Silicone, 10/pk	186000856		

¹ Plate 186001438 must be used with the quick load units. ² When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

10 mL Vial for Waters 2707 Autosampler

10 mL Screw Neck

Components	
22 x 45 mm Clear Glass Vial	186001420
Cap with x-slit PTFE Silicone Septa	186004632



45

For more details, see vials descriptions on pages 72 and 73.

Screw Cap 12 x 32 mm Vials for Compatible Systems



LCMS Certified Combination Packs									
Vial, Cap and Silicone/PTFE Septum	600000751CV	600000752CV	600000754CV	600000749CV					
Vial, Cap and Pre-slit Silicone/PTFE Septum	600000668CV	600000669CV	600000755CV	600000670CV					
LCGC Certified Combination Packs									
Bonded Silicone/PTFE Septum	186000272C	186000846C	186003885C	186000326C	186001126C	186001130C		WAT270946C ¹	
Combination Deactivated	186000272DV	186000846DV		186000326DV	186001126DV	186001130DV		WAT270946DV ¹	
Bonded Pre-slit Silicone/PTFE Septum	186000307C	186000847C	186003886C	186000327C	186001128C	186001131C			
Combination Deactivated	186000307DV	186000847DV		186000327DV	186001128DV	186001131DV			
Combination Packs									
Bonded Silicone/PTFE Septum							186002640		
Bonded Pre-slit Silicone/PTFE Septum							186002639		
Vials Only									
Vials Only	186000273	186000848		186002802	186002804	186002803	186002626	WAT063300	WAT094172
Deactivated Vials Only	186000273DV	186000848DV						WAT063300DV	
Inserts									
300 µL with Poly Spring	WAT094170	WAT094170						WAT094170	
300 µL with Poly Spring Deactivated	WAT094170DV	WAT094170DV						WAT094170DV	
150 µL with Poly Spring	WAT094171	WAT094171						WAT094171	
150 µL with Poly Spring Deactivated	WAT094171DV	WAT094171DV						WAT094171DV	
Cap and Septum									
PE Septumless Caps	186004169	186004169	186004169	186004169	186004169	186004169	186004169		
Black Cap								WAT058875	
Cap and Septum, Silicone/PTFE, Assembled									WAT094174
Septum Only, PTFE/Silicone, Pre-slit									WAT058876
Septum Only, Silicone/PTFE								WAT058874	WAT210685
Septum Only, PTFE									WAT058886
Screw Cap and Septum – Silicone/PTFE									
Blue LectraBond	186000274	186000274		186000274	186000274	186000274	186000274		
Red LectraBond	186002129	186002129		186002129	186002129	186002129	186002129		
Green LectraBond	186002130	186002130		186002130	186002130	186002130	186002130		
Screw Cap and Pre-slit Septum – Silicone/PTFE									
Blue LectraBond	186000305	186000305		186000305	186000305	186000305	186000305		
Red LectraBond	186002128	186002128		186002128	186002128	186002128	186002128		
Green LectraBond	186002127	186002127		186002127	186002127	186002127	186002127		

Compatible Systems									
Agilent Technologies	•	•		•	•	•	•		
Alcott, Antek, CTC, Spark, Thermal Separations								•	•
Beckman, Dynatech, Finnigan, Fisons, Gilson	•	•		•	•	•	•		
Hitachi, LDC, Perkin-Elmer, Shimadzu, Spectra-Physics, Thermo, Varian	•	•		•	•	•	•	•	•

All items come in quantities of 100 unless otherwise noted.

¹ Septum not bonded.

For more details, see vials descriptions on pages 72 and 73.



Snap and Crimp Cap 12 x 32 mm (9 mm Cap) Vials for Compatible Systems



Combination Packs							
Vial, Cap and Silicone/PTFE Septum				186001124(DV) ¹	186002642		
Vial, Cap and Pre-Slit Silicone/PTFE Septum				186001125(DV) ¹	186002641		
Vial, Cap and PTFE Septum				186001127(DV) ¹			
Vials Only							
Vials Only	WAT094219	WAT094220	186000984		186002628	WAT094222	WAT094223
Deactivated Vials Only	WAT094219DV	WAT094220DV	186000984DV			WAT094222DV	WAT094223DV
Inserts							
300 µL with Poly Spring	WAT094170(DV) ¹	WAT094170(DV) ¹				WAT094170(DV) ¹	WAT094170(DV) ¹
150 µL with Poly Spring	WAT094171(DV) ¹	WAT094171(DV) ¹				WAT094171(DV) ¹	WAT094171(DV) ¹
Snap Cap and Septum – Silicone/PTFE							
Blue	186000303	186000303	186000303	186000303	186000303		
Black	186002649	186002649	186002649	186002649	186002649		
Red	186002650	186002650	186002650	186002650	186002650		
Snap Cap and Pre-slit Septum – Silicone/PTFE							
Blue	186000304	186000304	186000304	186000304	186000304		
Black	186002648	186002648	186002648	186002648	186002648		
Red	186002647	186002647	186002647	186002647	186002647		
Snap Cap and PTFE Septum							
Blue	186000328	186000328	186000328	186000328	186000328		
Black	186002645	186002645	186002645	186002645	186002645		
Red	186002646	186002646	186002646	186002646	186002646		
Crimp Cap							
Crimp Cap Silicone/PTFE Septum						PSL404219	PSL404219
Crimp Cap PTFE/Silicone/PTFE Septum						PSL404231	PSL404231

Compatible Systems							
Agilent Technologies, Beckman, Dynatech, Finnigan, Fisons, Gilson, Hitachi, LDC, Perkin-Elmer, Shimadzu, Spectra-Physics, Varian	•	•	•	•	•	•	•
CTC, Spark, Thermal Separations						•	•

All items come in quantities of 100 unless otherwise noted.

¹ When (DV) appears beside the part number, a deactivated version of this product can be ordered by adding DV to the right of the part number.

For more details, see vials descriptions on pages 72 and 73.

Holder for 12 x 32 mm Vials



Description	Part No.
Holder for 12 x 32 mm Vials (5/pk)	186004487

(Vials not included)

15 x 45 mm Vials for Compatible Systems

15 x 45 mm Vials and Accessories

4 mL Screw Neck



62

Amber Screw Neck



63

Total Recovery



64

PP Screw Neck Vial



65

PP Snap Cap



66

Glass Shell Vial



67

Amber Glass Shell Vial



68

Combination Pack							
Vial, Cap and LectraBond PTFE/Silicone Septum	186000838C	186001133C	186002629C				
Combination Deactivated	186000838DV	186001133DV					
Vial, Cap and LectraBond Pre-slit PTFE/Silicone Septum	186000839C	186001134C	186002630C				
Combination Deactivated	186000839DV	186001134DV					
Vial and PE Snap Cap					186004031	WAT025051	WAT025050
Components							
Vials Only	186000840	186001135	186002520	186000999 ¹			
Deactivated Vials Only	186000840DV	186001135DV					
LectraBond Cap and Septum							
Black Cap PTFE/Silicone 100/pk	186000841	186000841	186000841				
Screw Cap with Bonded PTFE/Silicone Septum 1000/pk	186000965	186000965	186000965	186000965			
Black Cap Pre-slit PTFE/Silicone 100/pk	186000842	186000842	186000842				
Caps, Septa, and Inserts							
Black Phenol Cap 144/pk	WAT072711	WAT072711	WAT072711				
PTFE Septum 144/pk	WAT073005	WAT073005	WAT073005				
PTFE Septum 144/pk	WAT072714	WAT072714	WAT072714				
Self Sealing Septum 144/pk	WAT022861	WAT022861	WAT022861				
250 µL Glass Insert	WAT072704	WAT072704	WAT072704				
250 µL Glass Insert Deactivated	WAT072704DV	WAT072704DV	WAT072704DV				
250 µL Glass Insert 144/pk	WAT015199	WAT015199	WAT015199				
250 µL Glass Insert 144/pk Deactivated	WAT015199DV	WAT015199DV	WAT015199DV				
250 µL Plastic Conical Insert (PMP) 144/pk	WAT072030	WAT072030	WAT072030				
Springs for LVI 100/pk	WAT072708	WAT072708	WAT072708				
250 µL PP Insert 100/pk	186001729	186001729	186001729				

Compatible Systems							
Bruker, Kontron, Perkin-Elmer, Shimadzu, Tosoh, Unicam	.	.	.	.	.	.	.

¹ Item contains 1,000 vials.

For more details, see vials descriptions on pages 72 and 73.

4 mL Screw Cap



69

10 mL Screw Neck



70

GPC 2000 Vials

Components		
Vial	186000840	186001420
Black Screw Cap	600000162	186001421
PTFE Septum	WAT072714 ¹	186001422

¹ Item contains 144 vials.

For more details, see vials descriptions on pages 72 and 73.

Aqua Analysis System Vials

Components	
22 mL Vial with pre-slit silicone/PTFE septum, 100/pk	186004108
Solid Cap, PTFE/silicone liner, 100/pk. Solid cap for shipping water samples.	186004109
Mailing Box for 22 mL vials, 100/pk. Box for shipping samples to lab.	186004111

For more details, see vials descriptions on pages 72 and 73.



Settings for Alliance 2690 & 2695 Vials AND Low Volume Inserts (LVI)

The Waters 2690 Separations Module is set initially to accept vials with a bottom thickness <1.6 mm. Any vial that does not meet this criteria should not be used without first adding a positive needle offset to the “sample draw depth.” Failure to do so can cause vial breakage or needle damage.

Vial Column Number*	Description	Average Thickness	Needle Offset	Notes*	Comments
7	Screw Cap Glass Vial	0.037" (0.93 mm)	0	1,3	Add at least 1 mm offset when used with LVI
8	Screw Cap Glass Vial	0.037" (0.93 mm)	0	1,3	Add at least 1 mm offset when used with LVI
10	Polypropylene Screw Neck Vial (300 µL)	0.037" (0.93 mm)	1 mm		
25	Polypropylene Snap Cap Vial (300 µL)	0.037" (0.93 mm)	1 mm		
20	Total Recovery Vial	0.037" (0.93 mm)	0		
28	Total Recovery Vial	0.037" (0.93 mm)	0		
19	Screw Cap Glass Vial	0.037" (0.93 mm)	0	1,3	Add at least 1 mm offset when used with LVI
22	Snap Cap Glass Vial	0.063" (1.59 mm)	0	1,3	Add at least 1 mm offset when used with LVI
26	Crimp Cap Vial	0.068" (1.72 mm)	1 mm	2,3	Variable thickness; Add at least 1 mm offset when used with LVI
54	Screw Cap 'V' Vial	0.058" (1.46 mm)	0	1	Low volume (250 µL) vial
22	Low Volume Insert (300 µL)	0.024" (0.61 mm)	–	4	Use with vials with neck opening, 6 mm
26	Low Volume Insert (150 µL)	0.028" (0.71 mm)	–	4	Use with vials with neck opening, 6 mm
7	LVI (300 µL) in Screw	0.062" (1.57 mm)	0	1	Recommended configuration for this LVI
19	Cap Vial (7 mm neck)		–		
7	LVI (150 µL) in Screw	0.065" (1.65 mm)	1 mm	1	Recommended configuration—has the lowest sample volume requirement
19	Cap Vial (7 mm neck)		–		
26	LVI (300 µL) in Snap/Crimp	0.090" (2.27 mm)	1 mm	2	Variable thickness. Add at least 1 mm offset
27	Vial (6 mm neck)		–		
27	LVI (150 µL) in Snap/Crimp	0.091" (2.30 mm)	1 mm	2	Variable thickness. Add at least 1 mm offset
27	Vial (6 mm neck)		–		
27	Snap/Crimp Vial	0.068" (1.72 mm)	1 mm	2,3	Variable thickness; Add at least 1 mm offset when used with LVI
14	Snap Cap Vial	0.063" (1.59 mm)	0	1,3	Add at least 1 mm offset when used with LVI

* For more details, see vials descriptions on pages 72 and 73.

*Notes:

1. Clears needle tip—no offset required. Meets the criteria of a bottom thickness < 1.6 mm.
2. Does not clear needle tip—positive needle offset should be used.
3. Designed to accept Waters low volume inserts (LVI's)—at least 1 mm offset should be added.
4. This dimension should be added to vial bottom thickness and result checked against the criteria for bottom thickness.



Literature References

Sample Vials & Accessories Brochure,
Literature Reference 720001818EN

Waters LC/MS Certified
Sample Vials Whitepaper,
Literature Reference 720001517EN

Determination of the Level of Ion
Suppression from LC/MS Vials,
Literature Reference WA60004

Waters Certified Sample Vials
Technical Whitepaper,
Literature Reference 720001303EN

Vials for Alliance Systems

Most Commonly Used Vials for Alliance Systems	
7	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
8	Amber 12 x 32, Type 1, 51-Expansion Glass Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
9	Clear Maximum Recovery Vial 12 x 32, Type 1 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
10	Polypropylene 12 x 32, 300 µL Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
11	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck (6 mm Opening, 10 mm Cap).
12	Total Recovery Vial Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
13	Amber Maximum Recovery Vial, 12 x 32, Type 1 51-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
14	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Septumless Cap).

Screw Cap 12 x 32 mm Vials for Alliance Systems	
15	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
16	Amber 12 x 32, Type 1, 51-Expansion Glass Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
17	Clear Maximum Recovery Vial 12 x 32, Type 1 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
18	Polypropylene 12 x 32, 300 µL Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
19	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck (6 mm Opening, 10 mm Cap).
20	Total Recovery Vial Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
21	Amber Maximum Recovery Vial, 12 x 32, Type 1 51-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).

Snap Cap 12 x 32 mm Vials for Alliance Systems	
22	Clear 12 x 32, Type 1, 33-Expansion Glass, Snap Cap Vial (6 mm Opening, 9 mm Cap).
23	Amber 12 x 32, Type 1, 51-Expansion Glass Snap Cap Vial (6 mm Opening, 9 mm Cap).
24	Clear Maximum Recovery Vial 12 x 32, Type 1, 33-Expansion Glass, Snap Cap Vial (6 mm Opening, 9 mm Cap).
25	Polypropylene 12 x 32, 300 µL Snap Cap Vial (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
26	Clear 12 x 32, Type 1, 33-Expansion Glass, Crimp Top Vial (6 mm Opening, 12 mm Cap).
27	Amber 12 x 32, Type 1, 51-Expansion Glass, Crimp Top Vial (6 mm Opening, 12 mm Cap).
28	Total Recovery Vial Clear 12 x 32, Type 1, 33-Expansion Glass, Snap Cap Vial (6 mm Opening, 9 mm Cap).

Vials for Waters 717 Autosampler: 15 x 45 mm Vials	
29	Clear 15 x 45, Type 1, 33-Expansion Glass, Screw Neck Vial.
30	Amber 15 x 45, Type 1, 51-Expansion Glass, Screw Neck Vial.
31	Total Recovery Screw Neck Vial Clear Glass 15 x 45, Type 1, 33-Expansion Glass.
32	Polypropylene 15 x 45, 3 mL Round Bottom Screw Neck Vial 1,000/pk.
33	Polypropylene Snap Cap Vial with Conical Bottom, PE Snap Caps.
34	4 mL Glass Shell Vial with Polyethylene Snap Cap, Type 1, 51-Expansion Glass.
35	4 mL Amber Shell Vial with Polyethylene Snap Cap, Type 1, 51-Expansion Glass.

Vials for Waters 717 Autosampler: 8 x 40 mm Vials	
36	1 mL Clear Glass Shell Vial (8 x 40 mm) Type 1, 51-Expansion Glass with Polyethylene Snap Cap 250/pk.
37	1 mL Amber Glass Shell Vial (8 x 40 mm) Type 1, 51-Expansion Glass with Polyethylene Snap Cap, Type 1, 250/pk.
38	Total Recovery Clear Glass Vial (8 x 40 mm) with Polyethylene Snap Cap, Type 1, 51-Expansion Glass.
39	700 µL Polypropylene Vial (8 x 40 mm) with Polyethylene Snap Cap.

Vials for Waters 2707 Autosampler	
40	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Cap).
41	Amber 12 x 32, Type 1, 51-Expansion Glass Screw Neck with Quick Thread Design, (6 mm Opening, 9 mm Cap).
42	Waters Maximum Recovery Vial, 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
43	Waters Amber Maximum Recovery Vial, 12 x 32, Type 1, 51-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
44	Polypropylene 12 x 32, 300 µL Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
45	Clear 22 x 45 mm Type 1, 33-expansion glass screw neck vial

Vials for Compatible Systems

Screw Cap 12 x 32 mm Vials for Compatible Systems	
46	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
47	Amber 12 x 32, Type 1, 51-Expansion Glass Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
48	Amber Maximum Recovery Vial 12 x 32, Type 1, 51-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
49	Clear Maximum Recovery Vial 12 x 32, Type 1, 33-Expansion Glass, Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap).
50	Qsert Vial Clear Screw Cap Glass Vial, Quick Thread Design with Fused in Glass Insert (6 mm Opening, 9 mm Cap).
51	Qsert Vial Amber Screw Cap Glass Vial, Quick Thread Design with Fused in Glass Insert (6 mm Opening, 9 mm Cap).
52	Polypropylene 12 x 32, 300 µL Screw Neck with Quick Thread Design (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
53	Clear 12 x 32, Type 1, 33-Expansion Glass, Screw Neck (6 mm Opening, 10 mm Cap).
54	Polypropylene 12 x 32, 250 µL Screw Neck Vial (6 mm Opening, 8 mm Cap).

Snap and Crimp Cap 12 x 32 mm (9 mm Cap) Vials for Compatible Systems	
55	Clear 12 x 32, Type 1, 33-Expansion Glass, Snap Cap Vial (6 mm Opening, 9 mm Cap).
56	Amber 12 x 32, Type 1, 51-Expansion Glass Snap Cap Vial (6 mm Opening, 9 mm Cap).
57	Maximum Recovery Vial 12 x 32, Type 1, 33-Expansion Glass, Snap Cap Vial (6 mm Opening, 9 mm Cap).
58	Qsert Vial Clear Snap Cap Glass Vial with Fused in Glass Insert (6 mm Opening, 9 mm Cap).
59	Polypropylene 12 x 32, 300 µL Snap Cap Vial (6 mm Opening, 9 mm Cap). Reformulate Clean PP Vial.
60	Clear 12 x 32, Type 1, 33-Expansion Glass, Crimp Top Vial (6 mm Opening, 12 mm Cap).
61	Amber 12 x 32, Type 1, 51-Expansion Glass, Crimp Top Vial (6 mm Opening, 12 mm Cap).



15 x 45 mm Vials for Compatible Systems: Vials and Accessories

62	Clear 15 x 45, Type 1, 33-Expansion Glass, Screw Neck Vial.
63	Amber 15 x 45, Type 1, 51-Expansion Glass, Screw Neck Vial.
64	Waters Total Recovery Screw Neck Vial Clear Glass 15 x 45, Type 1, 33-Expansion Glass.
65	Polypropylene 15 x 45, 3 mL Screw Neck Vial.
66	Polypropylene Snap Cap Vial with Conical Bottom, PE Snap Caps.
67	4 mL Glass Shell Vial with Polyethylene Snap Cap, Type 1, 51-Expansion Glass.
68	4 mL Amber Shell Vial with Polyethylene Snap Cap, Type 1, 51-Expansion Glass.

15 x 45 mm Vials for Compatible Systems: GPC 2000 Vials

69	4 mL Glass Screw Neck Vial, Type 1, 33-Expansion Glass for GPC 2000.
70	10 mL Screw Neck Glass Vial for GPC 2000.

Vials Troubleshooting Guide

Waters offers solutions that help eliminate common problems that conventional sample vials have been known to cause in the laboratories.

Problem	Impact	Solution
Septum dislodged during shipment or use	<ul style="list-style-type: none"> Need to insert septum or need to rerun analysis Loss of time 	<ul style="list-style-type: none"> Check to see if needle is piercing in center of septa. Check to see if needle is sharp.
Vacuum forms in vial during sample draw	<ul style="list-style-type: none"> Sample spill over Sample draw reproducibility problems 	<ul style="list-style-type: none"> Use pre-slit septa which provides proper venting, eliminating sample spill over and insuring reproducible sample draw volumes.
Sample-limited applications require the use of cumbersome low-volume inserts	<ul style="list-style-type: none"> Increased labor required for inserting the LVI into the vial leads to delays in sample processing Increased labor time and difficulty when pipetting into small neck opening of LVI Additional handling increases chance of contamination Increased costs from purchasing multiple components: vial, cap and LVI 	<ul style="list-style-type: none"> Use Waters Total Recovery vial and Maximum Recovery vial: <ul style="list-style-type: none"> No need to use LVIs. Wide neck opening for easy sample pipetting. One less handling step reduces chance of contamination. Only need one component, saving storage space and costs.
Need to perform multiple injections with minimum residual volume in each vial requires LVI to obtain minimum residual volume, but maximum capacity is only 300 µL	<ul style="list-style-type: none"> Increased labor to fill additional sample vials Increased cost to purchase additional sample vials and LVIs 	<ul style="list-style-type: none"> Use Waters Total Recovery vial and Maximum Recovery vial: The increased capacity and low residual volume allows you to perform multiple injections with minimum residual volume in a single vial.
Need to use glass inserts in a 96-well plate format but it requires capping each insert one-at-a-time	<ul style="list-style-type: none"> Delay in sample processing 	<ul style="list-style-type: none"> The glass inserts in the Waters 96-well format allows for the use of a sealing cap mat, saving time and labor.
Frequent needle damage	<ul style="list-style-type: none"> Downtime causing missed deadlines Cost of repairs 	<ul style="list-style-type: none"> All Waters vials have dimensional specifications that eliminate the potential of needle damage.
Laboratory owns HPLC instruments from several different manufacturers	<ul style="list-style-type: none"> Purchasing several different vials Increased number of purchase orders Unable to take advantage of quantity discounts, leading to higher costs 	<ul style="list-style-type: none"> The tight dimensional tolerances on all Waters vials and accessories make them ideal for use with virtually all HPLC systems. Reduce the number of purchase orders and take advantage of quantity discounts by buying all your sample vials from Waters.
Analyte compounds are sticking to the glass surface of the vial	<ul style="list-style-type: none"> Loss of sample Loss of time Need to run the analysis again 	<ul style="list-style-type: none"> Deactivated glass vials and inserts: Waters uses a gas phase deactivation process that renders the glass surface inert. Unlike other deactivated vials, the surface modification is permanent, resulting in an indefinite shelf life.
Inconsistent quality between laboratory sites		<ul style="list-style-type: none"> Waters vials are distributed world wide from the same source.

Beware of Poor Quality Look-alike Vials

- Only Waters Alliance Total Recovery vials and Maximum Recovery vials utilize a proprietary manufacturing process, ensuring that the slope of the internal taper will deliver all of the sample to the bottom of the vial.
- The bottom thickness is held to a close tolerance eliminating needle damage caused by bottoming out.

2010/2011

Waters Quality Parts,[®] Chromatography Columns and Supplies Catalog

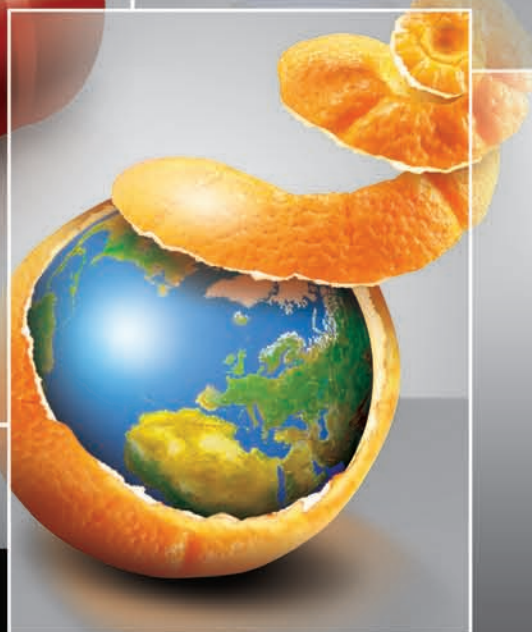
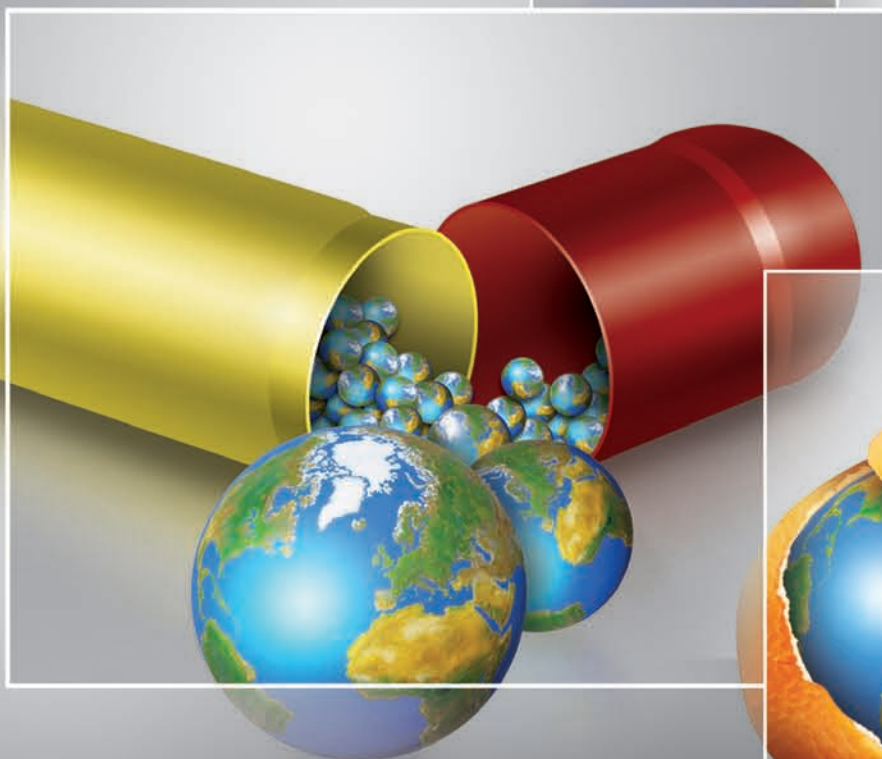
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We are pleased to present the 2010 Waters Quality Parts®,
Chromatography Columns and Supplies Catalog.

Our catalog contains today's leading separations technology products. With 50 years of market leadership we remain committed to the development and manufacture of products that solve today's most challenging separations problems to enable our customer's success. We are driven by our core mission – to provide enabling technologies in products that set the industry standard for performance and reproducibility.

Waters provides the industry's broadest and deepest product offering manufactured to industry benchmark quality requirements by our world-class manufacturing organization and supported by our highly skilled sales and support teams. We invite you to visit our web site **www.waters.com** to access one of the largest application databases of its kind, surpassing 60,000 individual citations, abstracts, applications, literature and scientific articles.

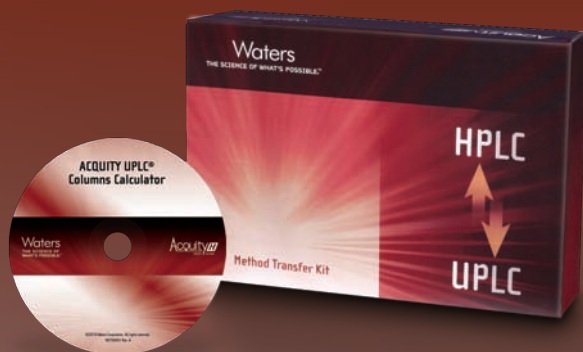
This year we are proud to introduce many new products including kits to enable method development, validation, and transfer for our family of ACQUITY UPLC systems, method development kits for therapeutic peptides, food safety and environmental analysis, Amide, Glycan and High Strength Silica (HSS) columns, and IEX and SEC columns for analytical and purification applications.

To learn more about how we can help you achieve your objectives please telephone one of our 54 worldwide offices and interact with our highly trained account specialists.

Michael J. Yelle

Senior Director, Chemistry Commercial Operations
Waters Corporation Milford, MA, U.S.A.

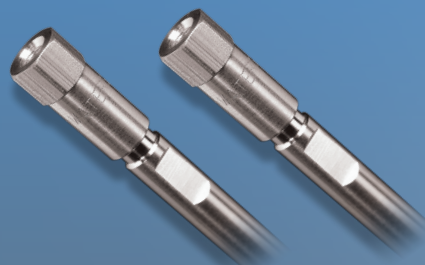
Method Transfer Kits



Page 90

New Method Transfer kits are designed to preserve the integrity of a separation as it is transferred between UPLC and HPLC platforms. Based on the concept of maintaining column length [L] to particle size [dp] ratio [L/dp], these kits provide an ACQUITY UPLC column with an HPLC column of equivalent selectivity and resolving power. Using the ACQUITY UPLC columns calculator (included with each kit), methods can be fully transferred from HPLC to UPLC or from UPLC to HPLC.

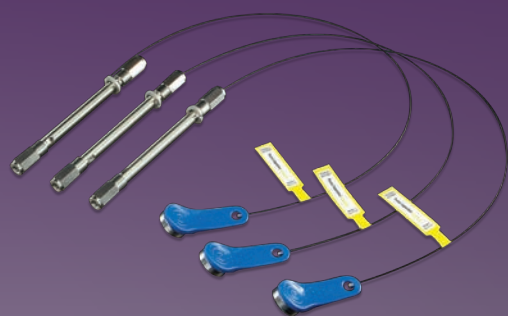
High Strength Silica [HSS] HPLC Columns



Page 124

Waters developed HSS HPLC columns in response to the active feedback of our customers that have developed UPLC assays, yet require the need to transfer UPLC methods to HPLC. This is necessary in efforts to utilize existing LC systems present in other parts of an organization, or contract partners, which have not yet implemented UPLC Technology. Present in three chemistries (C₁₈, C₁₈ SB and T3) and two HPLC particle sizes (3.5 and 5 µm), HSS HPLC columns enable methods to be seamlessly transferred between HPLC and UPLC systems.

Protein-Pak Hi Res Ion-Exchange (IEX) Columns



Page 201

The Protein-Pak™ Hi Res IEX column family consists of three ion-exchange column chemistries each contained on monodisperse, non-porous particles for the analysis of intact biomolecules including monoclonal antibodies, recombinant proteins, DNA/RNA and vaccine components.

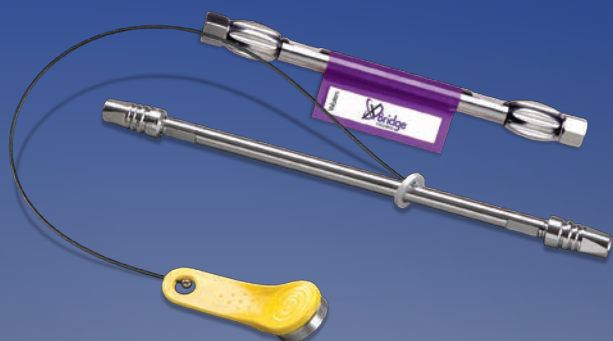
ACQUITY UPLC BEH200 SEC Columns



Page 201

ACQUITY UPLC analytical size-exclusion chromatography (SEC) columns for the characterization of proteins and their aggregates. By applying the power of UPLC technology, you can now obtain accurate, precise, high-throughput quantitative analysis of proteins such as therapeutic mAbs.

ACQUITY UPLC BEH and XBridge Amide columns



Pages 87 and 112

Based on Waters novel ethylene bridged hybrid (BEH) particle technology, the new ACQUITY UPLC BEH and XBridge Amide columns utilize a chemically stable, trifunctionally-bonded amide phase, enabling a new dimension in stability and versatility for HILIC separations. The XBridge Amide columns offer the same selectivity as the ACQUITY Amide columns, allowing scientists to transfer their separations between HPLC and UPLC platforms.

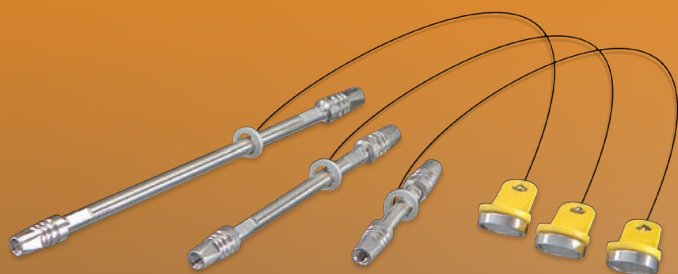
PST Therapeutic Peptide Method Development Kit



Page 191

The PST Therapeutic Peptide Method Development Kit has been developed to simplify the process of sample preparation and LC method development for the analysis of therapeutic peptides in plasma. The kit contains an Oasis PST μ Elution Method Development Plate, a PST 300Å C₁₈ reversed-phase column and the detailed screening protocol.

ACQUITY UPLC BEH Glycan columns



Page 226

New ACQUITY UPLC BEH Glycan columns, specifically developed and QC tested to provide superior UPLC component resolution in less time for the wide range of glycan profiles from biopharmaceutical proteins.

Environmental and Food Solution Kits



Page 47

Utilizing an array of cutting-edge products, Waters Solution Kits provide the user with fast, reliable data and low detection limits. Including ACQUITY UPLC technology, Oasis SPE cartridges, Certified Vials and validated methods, Waters Kits include solutions for Perfluorinated Compounds (PFCs), Bisphenol A (BPA), Pharmaceuticals and Carbamates.



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Offering an uncomplicated introduction to the technology of liquid chromatography [LC], with a focus on HPLC, this basic book uses clear language, colorful diagrams, and a full glossary to acquaint readers with basic concepts and terminology. This primer is suitable for younger science students as well as professionals new to LC.

Paperback, 52 pages, ISBN 978-1-879732-02-5

Beginners Guide to Liquid Chromatography

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Beginners Guide to UPLC (Ultra-Performance Liquid Chromatography)

Success is assured once new, experienced, and potential UPLC users learn from this volume the 'why' and the 'how' of UPLC Technology principles. Scientists will gain the confidence to apply this knowledge in ways that enhance analytical productivity, streamline workflow, and advance scientific progress within their organizations.

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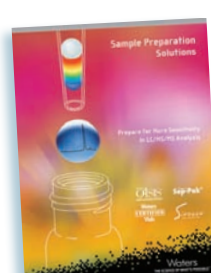
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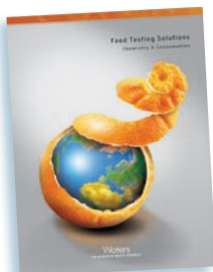
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Waters Corporation—eCommerce

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If you are interested in discussing or establishing an electronic relationship for orders or invoices with Waters, please contact Nancy Resteghini at 1-508-482-8615.

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Click **Login** in the upper right corner of the website.

- If you have previously registered: enter your **Email Address**, **Password** and click **Login**.
- If you have never registered: Click **Sign Up** and complete the waters.com registration form.

Registering allows you ongoing access to Waters events, information, shopping, and support.

How do I find chemistry-related consumables when I don't know what I am looking for?

1. Click the **Products & Markets** tab > **Chromatography Consumables & Columns** > and select a Product Category (for example: **Analytical & Preparative Columns**).
 2. Select a value from the new filter bar design (**Chemistry, Particle Size** etc.) displaying relevant facets and value selections that can be used to drill down to your desired result.
 3. Continue to select values from the various menus to refine the results until you locate the desired product, click on the product header (for more details) or simply fill in a **Quantity** and click **Add to Cart**.
- * If you select a Product within the Product Category or through the left-hand navigation (for example: XBridge Columns), click on **Find Products** first and the proceed to step 2 (above).

I already know my part number.

1. Click **Cart** in the upper right corner of the website.
2. Using the Quick Order box: enter the **Product Number**, **Quantity** and click **Add to Cart**. Your items are added directly to the shopping cart.

How do I use Favorites?

You can identify products as a Favorite to expedite ordering in the future.

To add an item to your Favorites:

1. Click **Cart** to display your shopping cart.
2. Place a check mark next to the **Product Name** and click **Add to Favorites**.

To remove an item in your Favorites:

1. Click **My Account** and select **Favorites**.
2. Place a check mark next to the **Product Name** and click **Remove**.

To order using Favorites:

1. Click **My Account** and select **Favorites**.
2. Place a check mark in the box next to the **Product Name** and click **Add to Cart**. A message displays: *The selected item(s) have been successfully added to your cart.*
3. Click **Return to Favorites**. Click the **Close** button then **Cart** to return to your shopping cart.

What if I am unable to purchase on-line or have a purchase approval process?

Waters has provided the ability to email a copy of the Cart contents to someone else with your comments. Sending this information is especially helpful for those who do not have the ability to directly purchase on-line. You can inform your purchasing department, local distributor or *Waters Representative* of your interest or needs. It should not be considered an ordering process but may help you to expedite your order.

To use this feature:

1. Click **Cart**.
2. Click **Email**, enter the email address and a brief message if desired.
3. Click **Send**.

How do I see related items?

1. Click the **Products & Markets** tab > **Chromatography Consumables & Columns** > then select a **Product Area**.
2. Select **value(s)** to refine your results.
3. When you find your Product, click the **Product Name** and if there is a Related product, a **Related Product** tab is displayed. Click **Related Products** Tab.

NOTE: Not all products have Related Products available.

How do I view my order history?

To access your order history, from the Waters Home Page (after login):

1. Click **My Account**, then **Order History**.
2. Find your orders by indicating one of the following: Date, Order Number or Purchase Order Number, then click **Search**.

To access your order history from your **Cart**: click the **Close** button returning you to your previous page, select **My Account** and follow the same instructions above.

How do I find instrument spare parts when I don't know what I am looking for?

There are two ways to find instrument spare parts:

Using the Graphical Parts Locator:

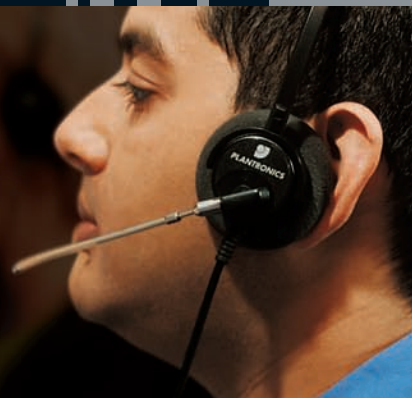
1. Click the **Services & Support** tab > **Find Spare Parts** > and **Graphical Parts Locator**.
2. Select a product from one of the dropdown lists, then select **Waters Quality Parts Locator**.
3. Move your cursor over the picture of the instrument to discover orderable parts, or select a part from the displayed list. Continue to explore and drill down through the photos and graphics until you find the part you need. Click the **Part Description**, fill in a **Quantity** and click **Add to Cart**.

Using Spare Parts Catalog:

1. Click the **Services & Support** tab > **Find Spare Parts** > and **Spare Parts Catalog**.
2. Select a **Value** from one of the Menus (**Product Category** etc.) to begin.
3. Continue to select values from the various menus to refine the results until you locate the desired part. Fill in a **Quantity** and click **Add to Cart**.



On-line at www.waters.com



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1. Can I order by phone or fax?

Yes, Monday through Friday from 8:00 a.m. – 6:00 p.m. E.S.T., just call our toll free number, 1-800-252-4752, press 1, press 1, or fax your order to 508-482-4820 (U.S.) or 905-678-2350 (Canada). When ordering, please have your purchase order number or credit card number, the catalog number and description for each product. We will also need your shipping address, including an attention line if applicable, and a complete billing address. In addition, please be sure to give us your daytime telephone number so that we can reach you promptly if there's a follow-up question about your order.

2. How do I release product(s) against my Chemical Products Standing Order?

To release product(s) from your chemical products standing/blanket order, call 1-800-252-4752, press 1, then press 5 for a direct line or for an alternate who will make arrangements to release the product(s) from your order or answer any questions that you may have. You can also fax your request to 508-482-2672.

3. When will I receive my order?

The majority of items in this catalog are in stock and will normally be shipped within 24 hours of receipt of your order. We can also arrange blanket or standing orders to meet your needs.

4. How will my order be shipped?

You select the transportation best suited to your needs. Waters offers FedEx and UPS as our standard carriers offering 3-day ground saver, Priority 1, 10:30 a.m. Next Day; Standard, 3:00 p.m. Next Day; and Economy Two-Day Service.

5. What are the payment terms?

Net 30 days. Shipment on U.S. orders is FOB, Franklin, MA.

6. How do I return an item?

A return authorization number (RA#) must be obtained to return an item. If an item is being returned for a warranty reason, please contact Technical Support at 1-800-252-4752, extension 8360. If the return is being requested due to an incorrect order, shipping error, or damage claim, please contact Customer Support at 1-800-252-4752, extension 8365.

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Waters Australia Pty. Limited
Unit 3, 38-46 South Street
P.O. Box 84
Rydalmere BC NSW 2116
Tel: 2 9933 1777
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Austria and European Export

(Central South Eastern Europe,
CIS and Middle East)
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Hietzinger Hauptstrasse 145
A-1130 Vienna
Tel: 431 877 18 07
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Belgium

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ConneXion Business Park
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Brazil

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Brasil LTDA
Alameda Tocantins, 270. andar
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Canada

Waters Limited
6427 Northam Drive
Mississauga
Ontario L4V 1J2
Tel: 800 252 4752
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China

Waters Technologies
(Shanghai) Limited
Block 41, Room 01
1387 Zhangdong Road
Pudong New District
Shanghai 201203, PR China
Tel: 86 21 6879 5888
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CIS/Russia

Waters Ges.m.b.H.
Representation Office
ul. Miklukho-Maklaia 16/10
117871 Moscow
Tel: +497 727 4490/290 9737
Fax: +7 495 336 7000

Czech Republic

Waters Ges.m.b.H.
Psohlavcu 43
147 00 Prague 4
Tel: 42 02 617 11384
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Denmark

Waters A/S
Baldersbuen 46
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Germany

Waters GmbH
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65760 Eschborn
Germany
Tel: 49 6196 400600
Fax: 49 6196 4006010

Hungary

Waters kft
Vaci ut 202
H-1138 Budapest
Tel: 36 1 350 5086
Fax: 36 1 350 5087

Hong Kong

Waters China Ltd.
Unit 608, 6/F,
Bio-Informatics Centre,
Hong Kong Science Park
Shatin, N.T. Hong Kong, China
Tel: 852 2964 1800
Fax: 852 2549 6802

India

Waters India Pvt. Ltd.
36A, II Phase
Peenya Industrial Park
Bangalore 560058
Tel: 91 80 2 837 1900
Fax: 91 80 2 839 2157

Ireland

Waters Chromatography
Ireland Ltd., Unit 3.1
Woodford Business Park
Santry, Dublin 9, Ireland
Tel: 353 1 448 1500
Fax: 353 1 448 1510

Italy

Waters S.P.A.
Via Achille Grandi, 27
20090 Vimodrone MI
Tel: 39 02 265 0983
Fax: 39 02 250 1827

Japan

Nihon Waters K.K.
Dai-5, Koike Bldg.
1-3-12 Kita-shinagawa
Shinagawa-ku, Tokyo 140-0001
Tel: (81) 3 3471 7191
Fax: (81) 3 3471 7118

Korea

4th Floor KICOX Venture Center
188-5 Guro-Dong, Guro-Gu
Seoul 152-050
Korea
Tel: (82) 2 6300 4800
Fax: (82) 2 6300 4830

Mexico

Waters S.A. DE C.V.
Moras No 822
Del Benito Juarez, Col. Acacias
C.P. 03230, Mexico D.F.
Tel: 5255 5524 7636
Fax: 5255 5524 9376

The Netherlands

Waters Chromatography B.V.
Florijnstraat 19
Postbus 379
4870 AJ Etten-Leur
Tel: 0031 (0)76-50.87.200
Fax: 0031 (0)76-50.87.280

Norway

Tel: 47 63 84 60 50
Fax: 47 63 84 00 10

Poland

Waters Sp z o.o
ul. Lektykarska 25 m 21
01-687 Warszawa
Tel: (48) 22 6393000
Fax: (48) 22 6393009

Puerto Rico

Waters Corp PR Branch
Ave. Gautier Benitez #230
Edif. Video Avenue 2nd Floor
Caguas, PR 00725
Tel: 787 747 8445
Fax: 787 747 8448

Singapore

Waters Asia Limited
1 Science Park Road
#02-01/06 The Capricorn
Singapore Science Park II
Singapore 117528
Tel: 65 6593 7100
Fax: 65 6873 0733

Spain

Waters Cromatografía, S.A.
Ronda Can Fatjó, 7-A
Parc Tecnològic del Vallès
08290 Cerdanyola del Vallès
Barcelona
Direct: 902 254 254
Tel: 34 936 009 300
Fax: 34 936 009 360

Sweden

Djupdalsvägen 12-14
SE-192 51 Sollentuna
Tel: 46 8 555 11500
Fax: 46 8 555 11550

Switzerland

Waters AG
Täferstrasse 4
Postfach
5405 Baden-Dättwil
Tel: 41 56 676 70 00
Fax: 41 56 676 70 49

Taiwan

Waters Asia Ltd., Taiwan Branch
11F-2, No.90, Sec. 1,
Jianguo N. Rd., Zhongshan Dist.,
Taipei City 10491, Taiwan, R.O.C.
Tel: 886 2 2501 9928
Fax: 886 2 2501 9228

United Kingdom

Waters U.K. Ltd.
730-740 Centennial Court
Centennial Park, Elstree,
Hertfordshire WD6 3SZ
Tel: 44 208 238 6100
Fax: 44 208 207 7070

All Other Countries**Waters Corporation**

34 Maple Street
Milford, MA 01757 USA
Tel: 508 478 2000
800 252 4752
Fax: 508 872 1990

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